CPC COOPERATIVE PATENT CLASSIFICATION

H03H IMPEDANCE NETWORKS, e.g. RESONANT CIRCUITS ; RESONATORS (measuring, testing G01R ; arrangements for producing a reverberation or echo sound G10K 15/08 ; impedance networks or resonators consisting of distributed impedances, e.g. of the waveguide type, H01P ; control of amplification, e.g. bandwidth control of amplifiers, H03G ; tuning resonant circuits, e.g. tuning coupled resonant circuits, H03J ; networks for modifying the frequency characteristics of communication systems H04B)

NOTE

This subclass covers :

networks comprising lumped impedance elements;

networks comprising distributed impedance elements together with lumped impedance elements;

networks comprising electromechanical or electro-acoustic elements;

networks simulating reactances and comprising discharge tubes or semiconductor devices;

constructions of electromechanical resonators.

In this subclass, the following expression is used with the meaning indicated:

"passive elements" means resistors, capacitors, inductors, mutual inductors or diodes.

Attention is drawn to the Notes following the titles of class B81 and subclass B81B relating to "micro-structural devices" and "micro-structural systems".

In this subclass, main groups with a higher number take precedence.

H03H 1/00 Constructional details of impedance networks whose electrical mode of operation is not specified or applicable to more than one type of network (constructional details of electromechanical transducers H03H 9/00)

H03H 1/0007 . { of radio frequency interference filters }

H03H 1/02 . of RC networks, e.g. integrated networks

H03H 2/00 Networks using elements or techniques not provided for in groups H03H 3/00 to H03H 21/00

H03H 2/001 . { comprising magnetostatic wave network elements }

H03H 2/003 . { comprising optical fibre network elements (optical elements per se G02B , G02F ; transmission systems using light waves H04B 10/00) }

H03H 2/005 . { Coupling circuits between transmission lines or antennas and transmitters, receivers

or amplifiers }

H03H 2/006 . . { Transmitter or amplifier output circuits }

H03H 2/008 . . { Receiver or amplifier input circuits }

H03H 3/00 **Apparatus or processes specially adapted for the manufacture of impedance networks, resonating circuits, resonators**

H03H 3/007 . for the manufacture of electromechanical resonators or networks

H03H 3/0072 . . { of micro-electro-mechanical resonators or networks (micro-membranes or micro-beams B81B 3/00M2 ; manufacture of micro-structural devices in general B81C) }

H03H 3/0073 . . . { Integration with other electronic structures }

H03H 3/0075 . . . { Arrangements or methods specially adapted for testing micro-elecro-mechanical resonators or networks }

H03H 3/0076 . . . { for obtaining desired frequency or temperature coefficients }

H03H 3/0077 . . . . { by tuning of resonance frequency }

H03H 3/0078 . . . . . { involving adjustment of the transducing gap }

H03H 3/013 . . for obtaining desired frequency or temperature coefficient ({ H03H 3/0076 } H03H 3/04 , H03H 3/10 take precedence)

H03H 3/02 . . for the manufacture of piezo-electric or electrostrictive resonators or networks (H03H 3/08 takes precedence)

H03H 3/04 . . . for obtaining desired frequency or temperature coefficient

H03H 3/06 . . for the manufacture of magnetostrictive resonators or networks

H03H 3/08 . . for the manufacture of resonators or networks using surface acoustic waves

H03H 3/10 . . . for obtaining desired frequency or temperature coefficient

H03H 5/00 **One-port networks comprising only passive electrical elements as network components**

H03H 5/003 . { comprising distributed impedance elements together with lumped impedance elements }

H03H 5/006 . { comprising simultaneously tunable inductance and capacitance }

H03H 5/02 . without voltage- or current-dependent elements

H03H 5/10 . . comprising at least one element with prescribed temperature coefficient

H03H 5/12 . with at least one voltage- or current-dependent element

H03H 7/00 **Multiple-port networks comprising only passive electrical elements as network components** (receiver input circuits H04B 1/18 ; networks simulating a length of communication cable H04B 3/40)

H03H 7/002 . { Gyrators }

H03H 7/004 . { Capacitive coupling circuits not otherwise provided for }

H03H 7/01 . Frequency selective two-port networks

H03H 7/0107 .. { Non-linear filters }

H03H 7/0115 .. { comprising only inductors and capacitors (H03H 7/075 , H03H 7/09 , H03H 7/12 , H03H 7/13 take precedence) }

H03H 7/0123 .. { comprising distributed impedance elements together with lumped impedance elements }

H03H 7/0138 .. { Electrical filters or coupling circuits }

H03H 7/0146 ... { Coupling circuits between two tubes, not otherwise provided for }

H03H 7/0153 .. { Electrical filters; Controlling thereof }

H03H 7/0161 ... { Bandpass filters (H03H 7/12 takes precedence) }

H03H 7/0169 .... { Intermediate frequency filters }

H03H 7/0176 ..... { witout magnetic core }

H03H 7/0184 ..... { with ferromagnetic core }

H03H 7/03 .. comprising means for compensation of loss

H03H 7/06 .. including resistors (H03H 7/075 , H03H 7/09 , H03H 7/12 , H03H 7/13 take precedence)

H03H 7/065 ... Parallel T-filters

H03H 7/07 ... Bridged T-filters

H03H 7/075 .. Ladder networks, e.g. electric wave filters

H03H 7/09 .. Filters comprising mutual inductance

H03H 7/12 .. Bandpass or bandstop filters with adjustable bandwidth and fixed centre frequency (H03H 7/09 takes precedence; automatic control of bandwidth in amplifiers H03G 5/16)

H03H 7/13 .. using electro-optic elements

H03H 7/17 .. { Structural details of sub-circuits of frequency selective networks }

WARNING

not complete, pending reorganisation, see provisionally also H03H 7/01 A, H03H 7/0123 to H03H 7/07 , H03H 7/09 to H03H 7/13 and H03H 7/42

H03H 7/1708 ... { Comprising bridging elements, i.e. elements in a series path without own reference to ground and spanning branching nodes of another series path (H03H 7/07 takes precedence) }

H03H 7/1716 ... { Comprising foot-point elements }

H03H 7/1725 .... { Element to ground being common to different shunt paths, i.e. Y-structure }

H03H 7/1733 .... { Element between different shunt or branch paths (H03H 7/425 takes precedence) }

H03H 7/1741 ... { Comprising typical LC combinations, irrespective of presence and location of additional resistors (when resistors are present, also classify in H03H 7/06 to H03H 7/07) }

H03H 7/175 .... { Series LC in series path (H03H 7/1783 takes precedence) }

H03H 7/1758 .... { Series LC in shunt or branch path (H03H 7/1791 takes precedence) }

H03H 7/1766 .... { Parallel LC in series path (H03H 7/1783 takes precedence) }

H03H 7/1775 .... { Parallel LC in shunt or branch path (H03H 7/1791 takes precedence) }

H03H 7/1783 .... { Combined LC in series path }

H03H 7/1791 .... { Combined LC in shunt or branch path }

H03H 7/18 . Networks for phase shifting

H03H 7/185 .. { comprising distributed impedance elements together with lumped impedance elements }

H03H 7/19 .. Two-port phase shifters providing a predetermined phase shift, e.g. "all-pass" filters

H03H 7/20 .. Two-port phase shifters providing an adjustable phase shift

H03H 7/21 .. providing two or more phase shifted output signals, e.g. n-phase output

H03H 7/24 . Frequency- independent attenuators

H03H 7/25 .. comprising an element controlled by an electric or magnetic variable (H03H 7/27 takes precedence)

H03H 7/251 ... { the element being a thermistor }

H03H 7/253 ... { the element being a diode }

H03H 7/255 .... { the element being a PIN diode }

H03H 7/256 .... { the element being a VARACTOR diode }

H03H 7/258 ... { using a galvano-magnetic device }

H03H 7/27 .. comprising a photo-electric element

H03H 7/30 . Time-delay networks { (analogue shift registers G11C 27/04) }

H03H 7/32 .. with lumped inductance and capacitance

H03H 7/325 ... { Adjustable networks }

H03H 7/34 .. with lumped and distributed reactance

H03H 7/345 ... { Adjustable networks }

H03H 7/38 . Impedance-matching networks

H03H 7/383 .. { comprising distributed impedance elements together with lumped impedance elements }

H03H 7/40 .. Automatic matching of load impedance to source impedance

H03H 7/42 . Balance/unbalance networks

H03H 7/422 .. { comprising distributed impedance elements together with lumped impedance elements }

H03H 7/425 .. { Balance-balance networks }

WARNING

not complete, pending reorganisation, see provisionally also H03H 1/00 to H03H 1/00 A, H03H 7/01 A, H03H 7/0123 to H03H 7/07 , H03H 7/09 to H03H 7/13 , H03H 7/42 and H03H 7/42 B

H03H 7/427 ... { Common-mode filters (H02J 3/01 and H02M 1/126 takes precedence) }

WARNING

not complete, pending reorganisation, see provisionally also H03H 1/00 to H03H 1/00 A, H03H 7/01 A, H03H 7/0123 to H03H 7/07 , H03H 7/09 to H03H 7/13 and H03H 7/42

H03H 7/46 . Networks for connecting several sources or loads, working on different frequencies or frequency bands, to a common load or source (for use in multiplex transmission systems H04J 1/00)

H03H 7/461 . . { particularly adapted for use in common antenna systems }

H03H 7/463 . . { Duplexers }

H03H 7/465 . . . { having variable circuit topology, e.g. including switches }

H03H 7/466 . . { particularly adapted as input circuit for receivers }

H03H 7/468 . . { particularly adapted as coupling circuit between transmitters and antennas }

H03H 7/48 . Networks for connecting several sources or loads, working on the same frequency or frequency band, to a common load or source (phase shifters providing two or more output signals H03H 7/21)

H03H 7/482 . . { particularly adapted for use in common antenna systems }

H03H 7/485 . . { particularly adapted as input circuit for receivers }

H03H 7/487 . . { particularly adapted as coupling circuit between transmitters and antennas }

H03H 7/52 . One-way transmission networks, i.e. unilines

H03H 7/54 . Modifications of networks to reduce influence of variations of temperature

H03H 9/00 **Networks comprising electromechanical or electro-acoustic devices ; Electromechanical resonators** (making single crystals C30B ; selection of materials thereof H01L ; piezo-electric, electrostrictive or magnetostrictive devices per se H01L 41/00 ; electromechanical transducers H04R)

H03H 9/0004 . { Impedance-matching networks (H03H 9/145 takes precedence) }

H03H 9/0009 . . { using surface acoustic wave devices }

H03H 9/0014 . . { using bulk acoustic wave devices }

H03H 9/0023 . { Balance-unbalance or balance-balance networks }

H03H 9/0028 . . { using surface acoustic wave devices }

H03H 9/0033 . . . { having one acoustic track only }

H03H 9/0038 . . . . { the balanced terminals being on the same side of the track }

H03H 9/0042 . . . . { the balanced terminals being on opposite sides of the track }

H03H 9/0047 . . . { having two acoustic tracks (H03H 9/008 , H03H 9/0085 take precedence) }

H03H 9/0052 . . . . { being electrically cascaded }

H03H 9/0057 . . . . . { the balanced terminals being on the same side of the tracks }

H03H 9/0061 . . . . . { the balanced terminals being on opposite sides of the tracks }

H03H 9/0066 . . . . { being electrically parallel }

H03H 9/0071 . . . . . { the balanced terminals being on the same side of the tracks }

H03H 9/0076 . . . . . { the balanced terminals being on opposite sides of the tracks }

H03H 9/008 . . . { having three acoustic tracks (H03H 9/0085 takes precedence) }

H03H 9/0085 . . . { having four acoustic tracks }

H03H 9/009 . . . . { Lattice filters }

H03H 9/0095 . . { using bulk acoustic wave devices }

H03H 9/02 . Details

H03H 9/02007 .. { of bulk acoustic wave devices }

H03H 9/02015 ... { Characteristics of piezoelectric layers, e.g. cutting angles }

H03H 9/02023 .... { consisting of quartz }

H03H 9/02031 .... { consisting of ceramic }

H03H 9/02039 .... { consisting of a material from the crystal group 32, e.g. langasite, langatate, langanite }

H03H 9/02047 ... { Treatment of substrates }

H03H 9/02055 .... { of the surface including the back surface }

H03H 9/02062 ... { Details relating to the vibration mode }

H03H 9/0207 .... { the vibration mode being harmonic }

H03H 9/02078 .... { the vibration mode being overmoded }

H03H 9/02086 ... { Means for compensation or elimination of undesirable effects }

H03H 9/02094 .... { of adherence }

H03H 9/02102 .... { of temperature influence (cutting angles H03H 9/02015) }

H03H 9/0211 .... { of reflections }

H03H 9/02118 .... { of lateral leakage between adjacent resonators }

H03H 9/02125 .... { of parasitic elements }

H03H 9/02133 .... { of stress }

H03H 9/02141 .... { of electric discharge due to pyroelectricity }

H03H 9/02149 .... { of ageing changes of characteristics, e.g. electro-acousto-migration }

H03H 9/02157 ... { Dimensional parameters, e.g. ratio between two dimension parameters, length, width or thickness }

H03H 9/0222 .. { of interface-acoustic, boundary, pseudo-acoustic or Stonely wave devices }

H03H 9/02228 .. { Guided bulk acoustic wave devices or Lamb wave devices having interdigital transducers situated in parallel planes on either side of a piezoelectric layer }

H03H 9/02236 .. { of surface skimming bulk wave devices }

H03H 9/02244 .. { of micro-electro-mechanical resonators }

H03H 9/02259 ... { Driving or detection means }

H03H 9/02275 .... { Comb electrodes }

H03H 9/02338 ... { Suspension means }

H03H 9/02362 .... { Folded-flexure }

H03H 9/02377 ..... { Symmetric folded-flexure }

H03H 9/02393 ... { Post-fabrication trimming of parameters, e.g. resonance frequency, Q factor }

H03H 9/02401 .... { by annealing }

H03H 9/02409 .... { by application of a DC-bias voltage (H03H 9/02417 takes precedence) }

H03H 9/02417 .... { involving adjustment of the transducing gap }

H03H 9/02425 ..... { by electrostatically pulling the beam }

H03H 9/02433 ... { Means for compensation or elimination of undesired effects }

H03H 9/02448 .... { of temperature influence }

H03H 9/02535 .. { of surface acoustic wave devices }

H03H 9/02543 ... { Characteristics of substrate, e.g. cutting angles }

H03H 9/02551 .... { of quartz substrates }
H03H 9/02559 .... { of lithium niobate or lithium-tantalate substrates }
H03H 9/02566 .... { of semiconductor substrates }
H03H 9/02574 .... { of combined substrates, multilayered substrates, piezo-electrical layers on not-piezo- electrical substrate }
H03H 9/02582 .... { of diamond substrates }
H03H 9/0259 .... { of langasite substrates }
H03H 9/02598 .... { of langatate substrates }
H03H 9/02606 .... { of langanite substrates }
H03H 9/02614 ... { Treatment of substrates, e.g. curved, spherical, cylindrical substrates ensuring closed round-about circuits for the acoustical waves }
H03H 9/02622 .... { of the surface, including back surface }
H03H 9/02629 .... { of the edges }
H03H 9/02637 ... { Details concerning reflective or coupling arrays }
H03H 9/02645 .... { Waffle-iron or dot arrays }
H03H 9/02653 .... { Grooves or arrays buried in the substrate }
H03H 9/02661 ..... { being located inside the interdigital transducers }
H03H 9/02669 .... { Edge reflection structures, i.e. resonating structures without metallic reflectors, e.g. Bleustein-Gulyaev-Shimizu (BGS), shear horizontal (SH), shear transverse (ST), Love waves devices }
H03H 9/02677 ..... { having specially shaped edges, e.g. stepped, U-shaped edges }
H03H 9/02685 .... { Grating lines having particular arrangements }
H03H 9/02692 ..... { Arched grating lines }
H03H 9/027 ..... { U-shaped grating lines }
H03H 9/02708 ..... { Shifted grating lines }
H03H 9/02716 ..... { Tilted, fan shaped or slanted grating lines }
H03H 9/02724 ..... { Comb like grating lines }
H03H 9/02732 ..... { Bilateral comb like grating lines }
H03H 9/0274 ..... { Intra-transducers grating lines }
H03H 9/02748 ..... { Dog-legged reflectors }
H03H 9/02755 ..... { Meandering floating or grounded grating lines }
H03H 9/02763 ..... { Left and right side electrically coupled reflectors }
H03H 9/02771 ..... { Reflector banks }
H03H 9/02779 .... { Continuous surface reflective arrays }
H03H 9/02787 ..... { having wave guide like arrangements }
H03H 9/02795 .... { Multi-strip couplers as track changers }
H03H 9/02803 .... { Weighted reflective structures }
H03H 9/02811 ..... { Chirped reflective or coupling arrays }
H03H 9/02818 ... { Means for compensation or elimination of undesirable effects }
H03H 9/02826 .... { of adherence }
H03H 9/02834 .... { of temperature influence (cut angles H03H 9/02543) }
H03H 9/02842 .... { of reflections (H03H 9/6406 takes precedence) }
H03H 9/0285 ..... { of triple transit echo }

H03H 9/02858 .... { of wave front distortion }
H03H 9/02866 .... { of bulk wave excitation and reflections }
H03H 9/02874 .... { of direct coupling between input and output transducers }
H03H 9/02881 .... { of diffraction of wave beam }
H03H 9/02889 .... { of influence of mass loading }
H03H 9/02897 .... { of strain or mechanical damage, e.g. strain due to bending influence }
H03H 9/02905 .... { Measures for separating propagation paths on substrate }
H03H 9/02913 .... { Measures for shielding against electromagnetic fields (shielding of electrical components in general H05K 9/00) }
H03H 9/02921 .... { Measures for preventing electric discharge due to pyroelectricity }
H03H 9/02929 .... { of ageing changes of characteristics, e.g. electro-acousto-migration }
H03H 9/02937 .... { of chemical damage, e.g. corrosion }
H03H 9/02944 .... { of ohmic loss }
H03H 9/02952 .... { of parasitic capacitance }
H03H 9/0296 ... { Surface acoustic wave [SAW } devices having both acoustic and non-acoustic properties]
H03H 9/02968 .... { with optical devices (mounting in enclosures H03H 9/12) }
H03H 9/02976 .... { with semiconductor devices }
H03H 9/02984 ... { Protection measures against damaging }
H03H 9/02992 ... { Details of bus bars, contact pads or other electrical connections for finger electrodes }
H03H 9/05 .. Holders ; Supports
H03H 9/0504 ... { for bulk acoustic wave devices }
H03H 9/0509 .... { consisting of adhesive elements }
H03H 9/0514 .... { consisting of mounting pads or bumps }
H03H 9/0519 ..... { for cantilever (H03H 9/1021 takes precedence) }
H03H 9/0523 ..... { for flip-chip mounting }
H03H 9/0528 .... { consisting of clips }
H03H 9/0533 .... { consisting of wire }
H03H 9/0538 ... { Constructional combinations of supports or holders with electromechanical or other electronic elements }
H03H 9/0542 .... { consisting of a lateral arrangement (H03H 9/0566 takes precedence) }
H03H 9/0547 .... { consisting of a vertical arrangement (H03H 9/0566 takes precedence) }
H03H 9/0552 ..... { the device and the other elements being mounted on opposite sides of a common substrate }
H03H 9/0557 ..... { the other elements being buried in the substrate }
H03H 9/0561 ..... { consisting of a multilayered structure }
H03H 9/0566 .... { for duplexers }
H03H 9/0571 ..... { including bulk acoustic wave [BAW } devices]
H03H 9/0576 ..... { including surface acoustic wave [SAW } devices]
H03H 9/058 ... { for surface acoustic wave devices }
H03H 9/0585 .... { consisting of an adhesive layer }
H03H 9/059 .... { consisting of mounting pads or bumps }
H03H 9/0595 ... { the holder support and resonator being formed in one body }

H03H 9/08 . . . Holders with means for regulating temperature

H03H 9/09 . . . Elastic or damping supports

H03H 9/10 . . . Mounting in enclosures { (constructional combinations of enclosure with electromechanical and other electronic elements H03H 9/0538) }

H03H 9/1007 . . . . { for bulk acoustic wave [BAW } devices]

H03H 9/1014 . . . . . { the enclosure being defined by a frame built on a substrate and a cap, the frame having no mechanical contact with the BAW device }

H03H 9/1021 . . . . . { the BAW device being of the cantilever type }

H03H 9/1028 . . . . . { the BAW device being held between spring terminals }

H03H 9/1035 . . . . . { the enclosure being defined by two sealing substrates sandwiching the piezoelectric layer of the BAW device }

H03H 9/1042 . . . . . { the enclosure being defined by a housing formed by a cavity in a resin }

H03H 9/105 . . . . . { the enclosure being defined by a cover cap mounted on an element forming part of the BAW device }

H03H 9/1057 . . . . { for micro-electro-mechanical devices }

H03H 9/1064 . . . . { for surface acoustic wave [SAW } devices]

H03H 9/1071 . . . . . { the enclosure being defined by a frame built on a substrate and a cap, the frame having no mechanical contact with the SAW device }

H03H 9/1078 . . . . . { the enclosure being defined by a foil covering the non-active sides of the SAW device }

H03H 9/1085 . . . . . { the enclosure being defined by a non-uniform sealing mass covering the non-active sides of the BAW device }

H03H 9/1092 . . . . . { the enclosure being defined by a cover cap mounted on an element forming part of the surface acoustic wave [SAW } device on the side of the IDT`s]

H03H 9/12 . . . . for networks with interaction of optical and acoustic waves

H03H 9/125 . . Driving means, e.g. electrodes, coils

H03H 9/13 . . . for networks consisting of piezo-electric or electrostrictive materials (H03H 9/145 takes precedence)

H03H 9/131 . . . . { consisting of a multilayered structure }

H03H 9/132 . . . . { characterized by a particular shape }

H03H 9/133 . . . . { for electromechanical delay lines or filters }

H03H 9/135 . . . for networks consisting of magnetostrictive materials (H03H 9/145 takes precedence)

H03H 9/145 . . . for networks using surface acoustic waves

H03H 9/14502 . . . . { Surface acoustic wave [SAW } transducers for a particular purpose]

H03H 9/14505 . . . . . { Unidirectional SAW transducers }

H03H 9/14508 . . . . . { Polyphase SAW } transducers]

H03H 9/14511 . . . . . { SAW transducers for non-piezoelectric substrates }

H03H 9/14514 . . . . . { Broad band transducers }

H03H 9/14517 . . . . { Means for weighting }

H03H 9/1452 . . . . . { by finger overlap length, apodisation }

H03H 9/14523 . . . . . { Capacitive tap weighted transducers }

H03H 9/14526 . . . . . { Finger withdrawal }

H03H 9/14529 . . . . . { Distributed tap }

H03H 9/14532 ..... { Series weighting; Transverse weighting }
H03H 9/14535 ..... { Position weighting }
H03H 9/14538 .... { Formation }
H03H 9/14541 ..... { Multilayer finger or busbar electrode }
H03H 9/14544 .... { Transducers of particular shape or position (weighting H03H 9/14517) }
H03H 9/14547 ..... { Fan shaped; Tilted; Shifted; Slanted; Tapered; Arched; Stepped finger transducers }
H03H 9/1455 ..... { constituted of N parallel or series transducers }
H03H 9/14552 ..... { comprising split fingers }
H03H 9/14555 ..... { Chirped transducers (H03H 9/6406 takes precedence) }
H03H 9/14558 ..... { Slanted, tapered or fan shaped transducers (H03H 9/14561 , H03H 9/14564 take precedence) }
H03H 9/14561 ..... { Arched, curved or ring shaped transducers }
H03H 9/14564 ..... { Shifted fingers transducers }
H03H 9/14567 ..... { Stepped-fan shaped transducers }
H03H 9/1457 ..... { Transducers having different finger widths }
H03H 9/14573 ..... { Arrow type transducers }
H03H 9/14576 ..... { Transducers whereby only the last fingers have different characteristics with respect to the other fingers, e.g. different shape, thickness or material, split finger }
H03H 9/14579 ..... { the last fingers having a different shape }
H03H 9/14582 ..... { the last fingers having a different pitch }
H03H 9/14585 ..... { the last fingers being split }
H03H 9/14588 ..... { Horizontally-split transducers }
H03H 9/14591 ..... { Vertically-split transducers }
H03H 9/14594 ..... { Plan-rotated or plan-tilted transducers }
H03H 9/14597 .... { Matching SAW transducers to external electrical circuits }

H03H 9/15 . Constructional features of resonators consisting of piezo-electric or electrostrictive material (H03H 9/25 takes precedence)
H03H 9/17 .. having a single resonator (crystal tuning forks H03H 9/21)
H03H 9/171 ... { implemented with thin-film techniques, i.e. of the film bulk acoustic resonator (FBAR) type }
H03H 9/172 .... { Means for mounting on a substrate, i.e. means constituting the material interface confining the waves to a volume }
H03H 9/173 ..... { Air-gaps }
H03H 9/174 ..... { Membranes }
H03H 9/175 ..... { Acoustic mirrors }
H03H 9/176 ... { consisting of ceramic material (H03H 9/177 , H03H 9/178 take precedence) }
H03H 9/177 ... { of the energy-trap type }
H03H 9/178 ... { of a laminated structure of multiple piezoelectric layers with inner electrodes }
H03H 9/19 ... consisting of quartz
H03H 9/205 .. having multiple resonators (crystal tuning forks H03H 9/21)
H03H 9/21 .. Crystal tuning forks

H03H 9/215 . . . consisting of quartz

H03H 9/22 . Constructional features of resonators consisting of magnetostrictive material

H03H 9/24 . Constructional features of resonators of material which is not piezo-electric, electrostrictive, or magnetostrictive

H03H 9/2405 . . { of micro-electro-mechanical resonators }

H03H 9/2426 . . . { in combination with other electronic elements }

H03H 9/2431 . . . { Ring resonators }

H03H 9/2436 . . . { Disk resonators }

H03H 9/2447 . . . { Beam resonators (H03H 9/2468 takes precedence) }

H03H 9/2452 . . . . { Free-free beam resonators }

H03H 9/2457 . . . . { Clamped-free beam resonators }

H03H 9/2463 . . . . { Clamped-clamped beam resonators }

H03H 9/2468 . . . { Tuning fork resonators }

H03H 9/2473 . . . . { Double-Ended Tuning Fork (DETF) resonators }

H03H 9/2478 . . . . { Single-Ended Tuning Fork resonators }

H03H 9/2484 . . . . . { with two fork tines, e.g. Y-beam cantilever }

H03H 9/2489 . . . . . { with more than two fork tines }

H03H 9/2494 . . . . { H-shaped, i.e. two tuning forks with common base }

H03H 9/25 . Constructional features of resonators using surface acoustic waves { (devices for manipulating acoustic surface waves in general G10K 11/36) }

H03H 9/30 . Time-delay networks

H03H 9/36 . . with non-adjustable delay time (H03H 9/40 , H03H 9/42 take precedence)

H03H 9/38 . . with adjustable delay time (H03H 9/40 , H03H 9/42 take precedence)

H03H 9/40 . . Frequency dependent delay lines, e.g. dispersive delay lines (H03H 9/42 takes precedence)

H03H 9/42 . . using surface acoustic waves { (devices for manipulating acoustic surface waves in general G10K 11/36) }

H03H 9/423 . . . { with adjustable delay time }

H03H 9/426 . . . { Magneto-elastic surface waves }

H03H 9/44 . . . Frequency dependent delay lines, e.g. dispersive delay lines

H03H 9/46 . Filters (multiple-port electromechanical filters H03H 9/70)

H03H 9/462 . . { Micro-electro-mechanical filters }

H03H 9/465 . . . { in combination with other electronic elements }

H03H 9/467 . . . { Post-fabrication trimming of parameters, e.g. center frequency }

H03H 9/48 . . Coupling means therefor

H03H 9/485 . . . { for micro-electro-mechanical filters }

H03H 9/50 . . . Mechanical coupling means

H03H 9/505 . . . . { for micro-electro-mechanical filters }

H03H 9/52 . . . Electric coupling means

H03H 9/525 . . . . { for micro-electro-mechanical filters }

H03H 9/54 .. comprising resonators of piezo-electric or electrostrictive material (H03H 9/64 takes precedence)

H03H 9/542 ... { including passive elements (H03H 9/545 takes precedence) }

H03H 9/545 ... { including active elements }

H03H 9/547 ... { Notch filters, e.g. notch BAW or thin film resonator filters }

H03H 9/56 ... Monolithic crystal filters

H03H 9/562 .... { comprising a ceramic piezoelectric layer }

H03H 9/564 .... { implemented with thin-film techniques }

H03H 9/566 .... { Electric coupling means therefor (H03H 9/0095 takes precedence) }

H03H 9/568 ..... { consisting of a ladder configuration }

H03H 9/58 ... Multiple crystal filters

H03H 9/581 .... { comprising ceramic piezoelectric layers }

H03H 9/582 .... { implemented with thin-film techniques }

H03H 9/583 ..... { comprising a plurality of piezoelectric layers acoustically coupled }

H03H 9/584 ..... { Coupled Resonator Filters (CFR) }

H03H 9/585 ..... { Stacked Crystal Filters (SCF) }

H03H 9/586 ..... { Means for mounting to a substrate, i.e. means constituting the material interface confining the waves to a volume }

H03H 9/587 ..... { Air-gaps }

H03H 9/588 ..... { Membranes }

H03H 9/589 ..... { Acoustic mirrors }

H03H 9/60 .... Electric coupling means therefor { (H03H 9/0095 takes precedence) }

H03H 9/605 ..... { consisting of a ladder configuration }

H03H 9/62 .. comprising resonators of magnetostrictive material (H03H 9/64 takes precedence)

H03H 9/64 .. using surface acoustic waves

H03H 9/6403 ... { Programmable filters }

H03H 9/6406 ... { Filters characterised by a particular frequency characteristic }

H03H 9/6409 .... { SAW notch filters }

H03H 9/6413 .... { SAW comb filters }

H03H 9/6416 .... { SAW matched filters, e.g. surface acoustic wave compressors, chirped or coded surface acoustic wave filters }

H03H 9/642 ..... { SAW transducers details for remote interrogation systems, e.g. surface acoustic wave transducers details for ID-tags (remote interrogation systems per se G06K 7/10009 , G01S 13/74) }

H03H 9/6423 ... { Means for obtaining a particular transfer characteristic }

H03H 9/6426 .... { Combinations of the characteristics of different transducers }

H03H 9/643 .... { the transfer characteristic being determined by reflective or coupling array characteristics }

H03H 9/6433 .... { Coupled resonator filters }

H03H 9/6436 ..... { having one acoustic track only }

H03H 9/644 ..... { having two acoustic tracks }

H03H 9/6443 ..... { being acoustically coupled }

H03H 9/6446 ..... { by floating multistrip couplers (H03H 9/645 , H03H 9/6453 take

precedence) }

H03H 9/645 ..... { by grating reflectors overlapping both tracks }

H03H 9/6453 ..... { by at least an interdigital transducer overlapping both tracks }

H03H 9/6456 ..... { being electrically coupled }

H03H 9/6459 ..... { via one connecting electrode }

H03H 9/6463 ..... { the tracks being electrically cascaded }

H03H 9/6466 ..... { each track containing more than two transducers }

H03H 9/6469 ..... { via two connecting electrodes }

H03H 9/6473 ..... { the electrodes being electrically interconnected }

H03H 9/6476 ..... { the tracks being electrically parallel }

H03H 9/6479 ..... { Capacitively coupled SAW resonator filters }

H03H 9/6483 ..... { Ladder SAW filters }

H03H 9/6486 ..... { having crossing or intersecting acoustic tracks, e.g. intersection in a perpendicular or diagonal orientation }

H03H 9/6489 ... { Compensation of undesirable effects }

H03H 9/6493 .... { Side lobe suppression }

H03H 9/6496 .... { Reducing ripple in transfer characteristic }

H03H 9/66 . Phase shifters

H03H 9/68 .. using surface acoustic waves

H03H 9/70 . Multiple-port networks for connecting several sources or loads, working on different frequencies or frequency bands, to a common load or source

H03H 9/703 .. { Networks using bulk acoustic wave devices }

H03H 9/706 ... { Duplexers }

H03H 9/72 .. Networks using surface acoustic waves

H03H 9/725 ... { Duplexers }

H03H 9/74 . Multiple-port networks for connecting several sources or loads, working on the same frequency or frequency band, to a common load or source (networks for phase shifting H03H 9/66)

H03H 9/76 .. Networks using surface acoustic waves

H03H 11/00 Networks using active elements

WARNING

Group H03H 11/11 does not correspond to former or current IPC groups.
Concordance CPC : IPC for these groups is as follows: - H03H 11/11 - H03H 11/04

H03H 11/02 . Multiple-port networks

H03H 11/025 .. { using current conveyors }

H03H 11/04 .. Frequency selective two-port networks

H03H 11/0405 ... { Non-linear filters }

H03H 11/0416 ... { using positive impedance converters (H03H 11/08 takes precedence) }

H03H 11/0422 . . . { using transconductance amplifiers, e.g. gmC filters }

H03H 11/0427 . . . . { Filters using a single transconductance amplifier; Filters derived from a single transconductor filter, e.g. by element substitution, cascading, parallel connection (H03H 11/0433 to H03H11/C10 take precedence) }

H03H 11/0433 . . . . { Two integrator loop filters (H03H 11/0455 takes precedence) }

H03H 11/0438 . . . . . { Tow-Thomas biquad }

H03H 11/0444 . . . . { Simulation of ladder networks }

H03H 11/045 . . . . . { Leapfrog structures }

H03H 11/0455 . . . . { Multiple integrator loop feedback filters }

H03H 11/0461 . . . . { Current mode filters }

H03H 11/0466 . . . . { Filters combining transconductance amplifiers with other active elements, e.g. operational amplifiers, transistors, voltage conveyors }

H03H 11/0472 . . . . { Current or voltage controlled filters }

H03H 11/06 . . . comprising means for compensation of loss

H03H 11/08 . . . using gyrators

H03H 11/10 . . . using negative impedance converters (H03H 11/08 takes precedence)

H03H 11/11 . . . { using current conveyors }

H03H 11/12 . . . using amplifiers with feedback ({ H03H 11/0422 } , H03H 11/08 , H03H 11/10 take precedence)

H03H 11/1204 . . . . { Distributed RC filters }

H03H 11/1208 . . . . { comprising an electromechanical resonator }

H03H 11/1213 . . . . { using transistor amplifiers (H03H 11/1204 takes precedence; parallel-T filters H03H 11/1295) }

H03H 11/1217 . . . . { using a plurality of operational amplifiers (H03H 11/1204 takes precedence; parallel-T filters H03H 11/1295) }

H03H 11/1221 . . . . . { Theory; Synthesis (H03H 11/1226 to H03H 11/1252 take precedence) }

H03H 11/1226 . . . . . { Filters using operational amplifier poles }

H03H 11/123 . . . . . { Modifications to reduce sensitivity }

H03H 11/1234 . . . . . { Modifications to reduce detrimental influences of amplifier imperfections, e.g. limited gain-bandwith product, limited input impedance }

H03H 11/1239 . . . . . { Modifications to reduce influence of variations of temperature }

H03H 11/1243 . . . . . { Simulation of ladder networks }

H03H 11/1247 . . . . . { Leapfrog structures }

WARNING

Not complete, pending reorganisation, see provisionally also H03H 11/1217 to H03H 11/1252

H03H 11/1252 . . . . . { Two integrator-loop-filters }

H03H 11/1256 . . . . . { Tow-Thomas biquad }

WARNING

Not complete, pending reorganisation, see provisionally also H03H 11/1217 to H03H 11/1252

H03H 11/126 .... { using a single operational amplifier (H03H 11/1204 takes precedence; parallel-T filters H03H 11/1295) }

H03H 11/1265 ..... { Synthesis (H03H 11/1269 to H03H 11/1282 take precedence) }

H03H 11/1269 ..... { Filters using the operational amplifier pole }

H03H 11/1273 ..... { Modifications to reduce sensitivity }

H03H 11/1278 ..... { Modifications to reduce detrimental influences of amplifier imperfections, e.g. limited gain-bandwith product, limited input impedance }

H03H 11/1282 ..... { Modifications to reduce influence of variations of temperature }

H03H 11/1286 ..... { Sallen-Key biquad }

WARNING

Not complete, pending reorganisation, see provisionally also H03H 11/126 to H03H 11/1282

H03H 11/1291 .... { Current or voltage controlled filters }

H03H 11/1295 .... { Parallel-T filters }

H03H 11/14 ... using electro-optic devices

H03H 11/16 .. Networks for phase shifting

H03H 11/18 ... Two-port phase shifters providing a predetermined phase shift, e.g. "all-pass" filters

H03H 11/20 ... Two-port phase shifters providing an adjustable phase shift

H03H 11/22 ... providing two or more phase shifted output signals, e.g. n-phase output

H03H 11/24 .. Frequency-independent attenuators

H03H 11/245 ... { using field-effect transistor }

H03H 11/26 .. Time-delay networks (analogue shift registers G11C 27/04)

H03H 11/265 ... { with adjustable delay }

H03H 11/28 .. Impedance matching networks

H03H 11/30 ... Automatic matching of source impedance to load impedance

H03H 11/32 .. Balance-unbalance networks

H03H 11/34 .. Networks for connecting several sources or loads working on different frequencies or frequency bands, to a common load or source (for use in multiplex transmission systems H04J 1/00)

H03H 11/342 ... { particularly adapted for use in common antenna systems }

H03H 11/344 ... { Duplexers }

H03H 11/346 ... { particularly adapted as input circuit for receivers }

H03H 11/348 ... { particularly adapted as coupling circuit between transmitters and antenna }

H03H 11/36 .. Networks for connecting several sources or loads, working on the same frequency band, to a common load or source (phase shifters providing two or more output signals H03H 11/22)

H03H 11/362 ... { particularly adapted for use in common antenna systems }

H03H 11/365 ... { particularly adapted as input circuit for receivers }

H03H 11/367 ... { particularly adapted as coupling circuit between transmitters and antenna }

H03H 11/38 .. One-way transmission networks, i.e. unilines

H03H 11/40 . . Impedance converters

H03H 11/405 . . . { Positive impedance converters (H03H 11/42 takes precedence; used in frequency selective networks H03H 11/0416) }

H03H 11/42 . . . Gyrators (used in frequency selective networks H03H 11/08)

H03H 11/44 . . . Negative impedance converters (H03H 11/42 takes precedence; used in frequency selective networks H03H 11/10)

H03H 11/46 . One-port networks

H03H 11/48 . . simulating reactances

H03H 11/481 . . . { Simulating capacitances }

WARNING

Not complete, pending reorganisation, see provisionally also H03H 11/48 to H03H 11/52

H03H 11/483 . . . { Simulating capacitance multipliers }

WARNING

Not complete, pending reorganisation, see provisionally also H03H 11/48 to H03H 11/52

H03H 11/485 . . . { Simulating inductances using operational amplifiers }

WARNING

Not complete, pending reorganisation, see provisionally also H03H 11/48 to H03H 11/52

H03H 11/486 . . . { Simulating inductances using transconductance amplifiers }

WARNING

Not complete, pending reorganisation, see provisionally also H03H 11/48 to H03H 11/52

H03H 11/488 . . . { Simulating inductances using current conveyors }

WARNING

Not complete, pending reorganisation, see provisionally also H03H 11/48 to H03H 11/52

H03H 11/50 . . . using gyrators

H03H 11/52 . . simulating negative resistances

H03H 11/525 . . . { Simulating frequency dependent negative resistance [FDNR }]

WARNING

Not complete, pending reorganisation, see provisionally also H03H 11/52

H03H 11/53 . . { simulating resistances; simulating resistance multipliers }

WARNING

Not complete, pending reorganisation, see provisionally also H03H 11/48 to H03H 11/52

H03H 11/54 . Modifications of networks to reduce influence of variations of temperature

H03H 15/00 **Transversal filters** (electromechanical filters H03H 9/46 , H03H 9/70)

H03H 15/02 . using analogue shift registers

H03H 15/023 . . { with parallel-input configuration }

H03H 17/00 **Networks using digital techniques**

H03H 17/0009 . { Time-delay networks }

H03H 17/0018 . . { Realizing a fractional delay }

H03H 17/0027 . . . { by means of a non-recursive filter }

H03H 17/0036 . . . { by means of a recursive filter }

H03H 17/0045 . { Impedance matching networks }

H03H 17/0054 . { Attenuators }

H03H 17/0063 . { R, L, C, simulating networks }

H03H 17/02 . Frequency selective networks { (digital computers for complex mathematical operations G06F 17/10) }

H03H 17/0201 . . { Wave digital filters }

H03H 17/0202 . . { Two or more dimensional filters; Filters for complex signals (multidimensional convolutions G06F 17/153) }

H03H 17/0211 . . { using specific transformation algorithms, e.g. WALSH functions, Fermat transforms, Mersenne transforms, polynomial transforms, Hilbert transforms (correlation computation G06F 17/156) }

H03H 17/0213 . . . { Frequency domain filters using Fourier transforms }

H03H 17/0216 . . . { Quefrency domain filters }

H03H 17/0217 . . . { Number theoretic transforms }

H03H 17/0219 . . { Compensation of undesirable effects, e.g. quantisation noise, overflow (stability problems H03H 17/0461) }

H03H 17/0223 . . { Computation saving measures; Accelerating measures (computations per se G06F) }

H03H 17/0225 . . . { Measures concerning the multipliers }

H03H 17/0226 . . . . { comprising look-up tables }

H03H 17/0227 . . . { Measures concerning the coefficients }

H03H 17/0229 . . . . { reducing the number of taps }

H03H 17/023 . . . . { reducing the wordlength, the possible values of coefficients }

H03H 17/0233 . . . { Measures concerning the signal representation }

H03H 17/0235 .... { reducing the wordlength of signals }
H03H 17/0236 .... { using codes }
H03H 17/0238 ... { Measures concerning the arithmetic used (performing computations G06F 7/60) }
H03H 17/0239 .... { Signed digit arithmetic }
H03H 17/0241 .... { Distributed arithmetic }
H03H 17/0242 .... { Residue number arithmetic }
H03H 17/0248 .. { Filters characterised by a particular frequency response or filtering method }
H03H 17/025 ... { Notch filters }
H03H 17/0251 ... { Comb filters }
H03H 17/0252 ... { Elliptic filters }
H03H 17/0254 ... { Matched filters }
H03H 17/0255 ... { Filters based on statistics (adaptive filters H03H 21/0029) }
H03H 17/0257 .... { KALMAN filters }
H03H 17/0258 .... { ARMA filters }
H03H 17/026 ... { Averaging filters }
H03H 17/0261 ... { Non linear filters }
H03H 17/0263 .... { Rank order filters }
H03H 17/0264 ... { Filter sets with mutual related characteristics }
H03H 17/0266 .... { Filter banks }
H03H 17/0267 ..... { comprising non-recursive filters }
H03H 17/0269 ..... { comprising recursive filters }
H03H 17/027 .... { Complementary filters; Phase complementary filters }
H03H 17/0272 .... { Quadrature mirror filters }
H03H 17/0273 .... { Polyphase filters }
H03H 17/0275 ..... { comprising non-recursive filters }
H03H 17/0276 ..... { having two phases }
H03H 17/0277 ..... { comprising recursive filters }
H03H 17/0279 ..... { having two phases }
H03H 17/028 ... { Polynomial filters }
H03H 17/0282 ... { Sinc or gaussian filters (H03H 17/0671 takes precedence) }
H03H 17/0283 .. { Filters characterised by the filter structure (H03H 17/0202 , H03H 17/0219 to H03H 17/0248 take precedence) }
H03H 17/0285 ... { Ladder or lattice filters }
H03H 17/0286 ... { Combinations of filter structures }
H03H 17/0288 .... { Recursive, non-recursive, ladder, lattice structures }
H03H 17/0289 .... { Digital and active filter structures }
H03H 17/0291 .... { Digital and sampled data filters }
H03H 17/0292 ... { Time multiplexed filters; Time sharing filters }
H03H 17/0294 .. { Variable filters; Programmable filters }
H03H 17/04 .. Recursive filters
H03H 17/0405 ... { comprising a ROM addressed by the input and output data signals }
H03H 17/0411 ... { using DELTA modulation }

H03H 17/0416 . . . { with input-sampling frequency and output-delivery frequency which differ, e.g. extrapolation; Anti-aliasing }

H03H 17/0422 . . . . { the input and output signals being derived from two separate clocks, i.e. asynchronous sample rate conversion }

H03H 17/0427 . . . . { characterized by the ratio between the input-sampling and output-delivery frequencies }

H03H 17/0433 . . . . . { the ratio being arbitrary or irrational }

H03H 17/0438 . . . . . { the ratio being integer }

H03H 17/0444 . . . . . { where the output-delivery frequency is higher than the input sampling frequency, i.e. interpolation }

H03H 17/045 . . . . . { where the output-delivery frequency is lower than the input sampling frequency, i.e. decimation }

H03H 17/0455 . . . . . { the ratio being rational }

H03H 17/0461 . . . { Quantisation; Rounding; Truncation; Overflow oscillations or limit cycles eliminating measures }

H03H 17/06 . . Non-recursive filters

H03H 17/0607 . . . { comprising a ROM addressed by the input data signals }

H03H 17/0614 . . . { using Delta-modulation }

H03H 17/0621 . . . { with input-sampling frequency and output-delivery frequency which differ, e.g. extrapolation; Anti-aliasing }

H03H 17/0628 . . . . { the input and output signals being derived from two separate clocks, i.e. asynchronous sample rate conversion }

H03H 17/0635 . . . . { characterized by the ratio between the input-sampling and output-delivery frequencies }

H03H 17/0642 . . . . . { the ratio being arbitrary or irrational }

H03H 17/065 . . . . . { the ratio being integer }

H03H 17/0657 . . . . . { where the output-delivery frequency is higher than the input sampling frequency, i.e. interpolation }

H03H 17/0664 . . . . . { where the output-delivery frequency is lower than the input sampling frequency, i.e. decimation }

H03H 17/0671 . . . . . { Cascaded integrator-comb [CIC } filters]

H03H 17/0685 . . . . . { the ratio being rational }

H03H 17/08 . Networks for phase shifting

H03H 19/00 Networks using time-varying elements, e.g. N-path filters

H03H 19/002 . { N-path filters }

H03H 19/004 . { Switched capacitor networks }

H03H 19/006 . . { simulating one-port networks }

H03H 19/008 . { with variable switch closing time }

H03H 21/00 Adaptive networks

H03H 21/0001 . { Analogue adaptive filters }

H03H 21/0003 .. { comprising CCD devices }
H03H 21/0005 .. { comprising SAW devices }
H03H 21/0007 .. { comprising switched capacitor [SC } devices]

H03H 21/0012 . { Digital adaptive filters }
H03H 21/0014 .. { Lattice filters }
H03H 21/0016 .. { Non linear filters }
H03H 21/0018 .. { Matched filters }
H03H 21/002 .. { Filters with a particular frequency response (H03H 21/0014 to H03H 21/0018 take precedence) }
H03H 21/0021 ... { Notch filters }
H03H 21/0023 ... { Comb filters }
H03H 21/0025 .. { Particular filtering methods }
H03H 21/0027 ... { filtering in the frequency domain }
H03H 21/0029 ... { based on statistics }
H03H 21/003 .... { KALMAN filters }
H03H 21/0032 .... { ARMA filters }
H03H 21/0043 .. { Adaptive algorithms }
H03H 21/0067 .. { Means or methods for compensation of undesirable effects }

H03H 2001/00 **Constructional details of impedance networks whose electrical mode of operation is not specified or applicable to more than one type of network** (constructional details of electromechanical transducers H03H 9/00)

H03H 2001/0014 . Capacitor filters, i.e. capacitors whose parasitic inductance is of relevance to consider it as filter

H03H 2001/0021 . Constructional details
H03H 2001/0028 .. RFI filters with housing divided in two bodies
H03H 2001/0035 .. Wound magnetic core
H03H 2001/0042 .. Wound, ring or feed-through type capacitor
H03H 2001/005 .. Wound, ring or feed-through type inductor
H03H 2001/0057 .. comprising magnetic material
H03H 2001/0064 .. comprising semiconductor material
H03H 2001/0071 .. comprising zig-zag inductor
H03H 2001/0078 .. comprising spiral inductor on a substrate
H03H 2001/0085 .. Multilayer, e.g. LTCC, HTCC, green sheets (inside PCB filters H05K)

H03H 2001/0092 . Inductor filters, i.e. inductors whose parasitic capacitance is of relevance to consider it as filter

H03H 2003/00 **Apparatus or processes specially adapted for the manufacture of impedance networks, resonating circuits, resonators**

H03H 2003/007 . for the manufacture of electromechanical resonators or networks

H03H 2003/0071 . . of bulk acoustic wave and surface acoustic wave elements in the same process

H03H 2003/02 . . for the manufacture of piezo-electric or electrostrictive resonators or networks (H03H 3/08 takes precedence)

H03H 2003/021 . . . the resonators or networks being of the air-gap type

H03H 2003/022 . . . the resonators or networks being of the cantilever type

H03H 2003/023 . . . the resonators or networks being of the membrane type

H03H 2003/025 . . . the resonators or networks comprising an acoustic mirror

H03H 2003/026 . . . the resonators or networks being of the tuning fork type

H03H 2003/027 . . . the resonators or networks being of the micro-electro-mechanical [MEMS] type

H03H 2003/028 . . . for obtaining desired values of other parameters

H03H 2003/04 . . . for obtaining desired frequency or temperature coefficient

H03H 2003/0407 . . . . Temperature coefficient

H03H 2003/0414 . . . . Resonance frequency

H03H 2003/0421 . . . . . Modification of the thickness of an element

H03H 2003/0428 . . . . . of an electrode

H03H 2003/0435 . . . . . of a piezoelectric layer

H03H 2003/0442 . . . . . of a non-piezoelectric layer

H03H 2003/045 . . . . . Modification of the area of an element

H03H 2003/0457 . . . . . of an electrode

H03H 2003/0464 . . . . . operating on an additional circuit element, e.g. a passive circuit element connected to the resonator

H03H 2003/0471 . . . . . of a plurality of resonators at different frequencies

H03H 2003/0478 . . . . . in a process for mass production

H03H 2003/0485 . . . . . during the manufacture of a cantilever

H03H 2003/0492 . . . . . during the manufacture of a tuning-fork

H03H 2007/00 **Multiple-port networks comprising only passive electrical elements as network components** (receiver input circuits H04B 1/18 ; networks simulating a length of communication cable H04B 3/40)

H03H 2007/006 . MEMS

H03H 2007/008 . . the MEMS being trimmable

H03H 2007/01 . Frequency selective two-port networks

H03H 2007/013 . . Notch or bandstop filters

H03H 2007/0192 . . Complex filters

H03H 2007/38 . Impedance-matching networks

H03H 2007/386 . . Multiple band impedance matching

H03H 2009/00 **Networks comprising electromechanical or electro-acoustic devices ; Electromechanical resonators** (making single crystals C30B ; selection of materials thereof H01L ; piezo-electric, electrostrictive or magnetostrictive devices per se H01L 41/00 ; electromechanical transducers H04R)

H03H 2009/0019 . Surface acoustic wave multichip

H03H 2009/02 . Details
H03H 2009/02165 .. Tuning
H03H 2009/02173 ... of film bulk acoustic resonators [FBAR]
H03H 2009/02181 .... by application of heat from a heat source
H03H 2009/02188 .... Electrically tuning
H03H 2009/02196 ..... operating on the FBAR element, e.g. by direct application of a tuning DC voltage
H03H 2009/02204 ..... operating on an additional circuit element, e.g. applying a tuning DC voltage to a passive circuit element connected to the resonator
H03H 2009/02212 .... Magnetically tuning
H03H 2009/02244 .. { of micro-electro-mechanical resonators }
H03H 2009/02251 ... Design
H03H 2009/02259 ... { Driving or detection means }
H03H 2009/02267 .... having dimensions of atomic scale, e.g. involving electron transfer across vibration gap
H03H 2009/02283 ... Vibrating means
H03H 2009/02291 .... Beams
H03H 2009/02299 ..... Comb-like, i.e. the beam comprising a plurality of fingers or protrusions along its length
H03H 2009/02307 ..... Dog-bone-like structure, i.e. the elongated part of the "bone" is doubly clamped
H03H 2009/02314 ..... forming part of a transistor structure
H03H 2009/02322 ..... Material
H03H 2009/0233 .... comprising perforations
H03H 2009/02338 ... { Suspension means }
H03H 2009/02346 .... Anchors for ring resonators
H03H 2009/02354 ..... applied along the periphery, e.g. at nodal points of the ring
H03H 2009/02362 .... { Folded-flexure }
H03H 2009/0237 ..... applied at the center
H03H 2009/02385 .... Anchors for square resonators, i.e. resonators comprising a square vibrating membrane
H03H 2009/02433 ... { Means for compensation or elimination of undesired effects }
H03H 2009/0244 .... Anchor loss
H03H 2009/02456 .... Parasitic elements or effects, e.g. parasitic capacitive coupling between input and output
H03H 2009/02464 .... Pull-in
H03H 2009/02472 .... Stiction
H03H 2009/0248 .... Strain
H03H 2009/02488 ... Vibration modes
H03H 2009/02496 .... Horizontal, i.e. parallel to the substrate plane
H03H 2009/02503 ..... Breath-like, e.g. Lam? mode, wine-glass mode
H03H 2009/02511 .... Vertical, i.e. perpendicular to the substrate plane
H03H 2009/02519 .... Torsional
H03H 2009/02527 .... Combined

H03H 2009/15 . Constructional features of resonators consisting of piezo-electric or electrostrictive material (H03H 9/25 takes precedence)

H03H 2009/155 . . using MEMS techniques

H03H 2009/24 . Constructional features of resonators of material which is not piezo-electric, electrostrictive, or magnetostrictive

H03H 2009/2405 . . { of micro-electro-mechanical resonators }

H03H 2009/241 . . . Bulk-mode MEMS resonators

H03H 2009/2415 . . . . with concave shape [CBAR]

H03H 2009/2421 . . . . with I shape [IBAR]

H03H 2009/2442 . . . Square resonators

H03H 2011/00 **Networks using active elements**

WARNING

Group H03H 11/11 does not correspond to former or current IPC groups.
Concordance CPC : IPC for these groups is as follows: - H03H 11/11 - H03H 11/04

H03H 2011/02 . Multiple-port networks

H03H 2011/04 . . Frequency selective two-port networks

H03H 2011/0405 . . . { Non-linear filters }

H03H 2011/0411 . . . . Rank order or median filters

H03H 2011/0477 . . . using current feedback operational amplifiers

H03H 2011/0483 . . . using operational transresistance amplifiers [OTRA]

H03H 2011/0488 . . . Notch or bandstop filters

H03H 2011/0494 . . . Complex filters

H03H 2015/00 **Transversal filters** (electromechanical filters H03H 9/46 , H03H 9/70)

H03H 2015/002 . Computation saving measures

H03H 2015/005 . comprising capacitors implemented with MEMS technology

H03H 2015/007 . Programmable filters

H03H 2015/026 . Matched filters in charge domain

H03H 2017/00 **Networks using digital techniques**

H03H 2017/0072 . Theoretical filter design

H03H 2017/0081 . . of FIR filters

H03H 2017/009 . . of IIR filters

H03H 2017/02 . Frequency selective networks { (digital computers for complex mathematical operations G06F 17/10) }

H03H 2017/0202 .. { Two or more dimensional filters; Filters for complex signals (multidimensional convolutions G06F 17/153) }

H03H 2017/0204 ... Comb filters

H03H 2017/0205 ... Kalman filters

H03H 2017/0207 ... Median filters

H03H 2017/0208 ... using neural networks

H03H 2017/021 ... Wave digital filters

H03H 2017/0211 .. { using specific transformation algorithms, e.g. WALSH functions, Fermat transforms, Mersenne transforms, polynomial transforms, Hilbert transforms (correlation computation G06F 17/156) }

H03H 2017/0213 ... { Frequency domain filters using Fourier transforms }

H03H 2017/0214 .... with input-sampling frequency and output-delivery frequency which differ, e.g. interpolation, extrapolation ; anti-aliasing

H03H 2017/0219 .. { Compensation of undesirable effects, e.g. quantisation noise, overflow (stability problems H03H 17/0461) }

H03H 2017/022 ... Rounding error

H03H 2017/0222 ... Phase error

H03H 2017/0223 .. { Computation saving measures; Accelerating measures (computations per se G06F) }

H03H 2017/0227 ... { Measures concerning the coefficients }

H03H 2017/023 .... { reducing the wordlength, the possible values of coefficients }

H03H 2017/0232 ..... Canonical signed digit [CSD] or power of 2 coefficients

H03H 2017/0244 ... Measures to reduce settling time

H03H 2017/0245 ... Measures to reduce power consumption (H03H 17/0223 takes preference)

H03H 2017/0247 ... Parallel structures using a slower clock

H03H 2017/0294 .. { Variable filters; Programmable filters }

H03H 2017/0295 ... Changing between two filter characteristics

H03H 2017/0297 ... Coefficients derived from input parameters

H03H 2017/0298 .. DSP implementation

H03H 2017/04 .. Recursive filters

H03H 2017/0461 ... { Quantisation; Rounding; Truncation; Overflow oscillations or limit cycles eliminating measures }

H03H 2017/0466 .... Reduction of limit cycle oscillation

H03H 2017/0472 ... based on allpass structures

H03H 2017/0477 ... Direct form I

H03H 2017/0483 .... Transposed

H03H 2017/0488 ... Direct form II

H03H 2017/0494 .... Transposed

H03H 2017/06 .. Non-recursive filters

H03H 2017/0621 ... { with input-sampling frequency and output-delivery frequency which differ, e.g. extrapolation; Anti-aliasing }

H03H 2017/0635 .... { characterized by the ratio between the input-sampling and output-delivery frequencies }

H03H 2017/0671 ..... { Cascaded integrator-comb [CIC } filters]

H03H 2017/0678 ..... with parallel structure, i.e. parallel CIC [PCIC]

H03H 2017/0692 . . . Transposed

H03H 2021/00 Adaptive networks

H03H 2021/0001 . { Analogue adaptive filters }
H03H 2021/0009 . . Details
H03H 2021/001 . . . Analog multipliers

H03H 2021/0012 . { Digital adaptive filters }
H03H 2021/0025 . . { Particular filtering methods }
H03H 2021/0034 . . . Blind source separation
H03H 2021/0036 . . . . of convolutive mixtures
H03H 2021/0038 . . . . of instantaneous mixtures
H03H 2021/004 . . . . using state space representation
H03H 2021/0041 . . . Subband decomposition
H03H 2021/0043 . . { Adaptive algorithms }
H03H 2021/0045 . . . Equation error
H03H 2021/0047 . . . . Combined output and equation error
H03H 2021/0049 . . . Recursive least squares algorithm
H03H 2021/005 . . . . with forgetting factor
H03H 2021/0052 . . . . combined with stochastic gradient algorithm
H03H 2021/0054 . . . . . Affine projection
H03H 2021/0056 . . . Non-recursive least squares algorithm [LMS]
H03H 2021/0058 . . . . Block LMS, i.e. in frequency domain
H03H 2021/0059 . . . . Delayed LMS
H03H 2021/0061 . . . . Normalized LMS [NLMS]
H03H 2021/0063 . . . . . Proportionate NLMS
H03H 2021/0065 . . . . Sign-sign LMS
H03H 2021/0067 . . { Means or methods for compensation of undesirable effects }
H03H 2021/0069 . . . Finite wordlength
H03H 2021/007 . . Computation saving measures ; Accelerating measures
H03H 2021/0072 . . . Measures relating to the coefficients
H03H 2021/0074 . . . . Reduction of the update frequency
H03H 2021/0076 . . . Measures relating to the convergence time (H03H 2021/0072 takes preference)
H03H 2021/0078 . . . . varying the step size
H03H 2021/0079 . . . using look-up tables
H03H 2021/0081 . . Details
H03H 2021/0083 . . . Shadow filter, i.e. one of two filters which are simultaneously adapted, wherein the results of adapting the shadow filter are used for adapting the other filter
H03H 2021/0085 . . Applications
H03H 2021/0087 . . . Prediction
H03H 2021/0089 . . . System identification, i.e. modeling

H03H 2021/009 . . . . with recursive filters
H03H 2021/0092 . . . Equalization, i.e. inverse modeling
H03H 2021/0094 . . . Interference Cancelling
H03H 2021/0096 . . with input-sampling frequency and output-delivery frequency which differ, e.g. extrapolation ; anti-aliasing

H03H 2021/0098 . Adaptive filters comprising analog and digital structures

H03H 2210/00 Indexing scheme relating to details of tunable filters

H03H 2210/01 . Tuned parameter of filter characteristics
H03H 2210/012 . . Centre frequency ; Cut-off frequency
H03H 2210/015 . . Quality factor or bandwidth
H03H 2210/017 . . Amplitude, gain or attenuation

H03H 2210/02 . Variable filter component
H03H 2210/021 . . Amplifier, e.g. transconductance amplifier
H03H 2210/023 . . . Tuning of transconductance via tail current source
H03H 2210/025 . . Capacitor
H03H 2210/026 . . Inductor
H03H 2210/028 . . Resistor

H03H 2210/03 . Type of tuning
H03H 2210/033 . . Continuous
H03H 2210/036 . . Stepwise

H03H 2210/04 . Filter calibration method
H03H 2210/043 . . by measuring time constant
H03H 2210/046 . . Master -slave

H03H 2218/00 Indexing scheme relating to details of digital filters

H03H 2218/02 . Coefficients
H03H 2218/025 . . updated selectively, e.g. by, in the presence of noise, temporally cancelling the update and outputting a predetermined value

H03H 2218/04 . In-phase and quadrature [I/Q] signals

H03H 2218/06 . Multiple-input, multiple-output [MIMO] ; Multiple-input, single-output [MISO]

H03H 2218/08 . Resource sharing
H03H 2218/085 . . Multipliers

H03H 2218/10 . Multiplier and or accumulator units

H03H 2218/12 . Signal conditioning

H03H 2218/14 . Non-uniform sampling

H03H 2220/00 Indexing scheme relating to structures of digital filters

H03H 2220/02 . Modular, e.g. cells connected in cascade

H03H 2220/04 . Pipelined

H03H 2220/06 . Systolic

H03H 2220/08 . Variable filter length

H03H 2222/00 Indexing scheme relating to digital filtering methods

H03H 2222/02 . using fuzzy logic

H03H 2222/04 . using neural networks

H03H 2222/06 . using wavelets

H03H 2240/00 Indexing scheme relating to filter banks

H03H 2250/00 Indexing scheme relating to dual- or multi-band filters

H03H 2260/00 Theory relating to impedance networks